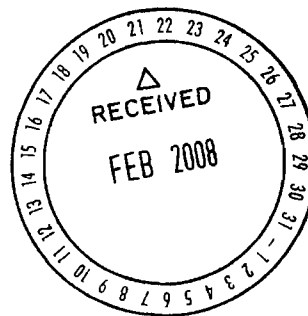




EBERLINE
SERVICES



February 19, 2008

Mr. Steve Trent
Fluor Hanford Inc.
1200 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R7-12-003-7017, SDG H3602

Dear Mr. Trent:

Enclosed is the data report for one solid (soil) sample designated under SAF No. F01-007 received at Eberline Services on November 30, 2007. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/hjv

Enclosure: Data Package

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H3602 was composed of one solid (soil) sample designated under SAF No. F01-007 with a Project Designation of: 216-A-4 and 200-E-102 Characterization Sampling and Analysis-Soil.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analysis

No problems were encountered during the course of the analyses.

2.5 Iodine-129 Analysis

No problems were encountered during the course of the analyses.

2.6 Total Uranium Analysis

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.8 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

2.9 Americium-241 Analysis

No problems were encountered during the course of the analyses.

2.10 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3602

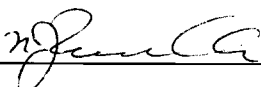
SDG 7017
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG_H3602

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S					
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Prepared by



Reviewed by

Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 02/19/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3602

SDG 7017
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H3602

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-RG
Version 3.06
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3602

SDG 7017
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H3602

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

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Version Ver 1.0
Form DVD-RG
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

LAB SAMPLE SUMMARY

SDG 7017

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Case no SDG H3602

LAB					CHAIN OF		
SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CUSTODY	COLLECTED
R712003-01	B1N203	E-102 Push Soil	SOLID		F07-001	F07-001-047	11/08/07 13:00
R712003-02	Lab Control Sample		SOLID		F07-001		
R712003-03	Method Blank		SOLID		F07-001		
R712003-04	Duplicate (R712003-01)	E-102 Push Soil	SOLID		F07-001		11/08/07 13:00

LAB SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol Fluor

Version Ver 1.0

Form DVD-LS

Version 3.06

Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

SDG 7017
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H3602

QC BATCH	CHAIN OF	CLIENT SAMPLE ID	MATRIX	%	SAMPLE	BASIS	DAYS SINCE		LAB	DEPARTMENT
	CUSTODY			SOLIDS	AMOUNT	AMOUNT	RECEIVED	COLL	SAMPLE ID	SAMPLE ID
7017	F07-001-047	B1N203	SOLID	96.5	786 g		11/30/07	22	R712003-01	7017-001
		Method Blank	SOLID						R712003-03	7017-003
		Lab Control Sample	SOLID						R712003-02	7017-002
		Duplicate (R712003-01)	SOLID	96.5	786 g		11/30/07	22	R712003-04	7017-004

Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

SDG 7017
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H3602

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED		QUALITY					
			BATCH	2σ %	CLIENT	MORE		RE	BLANK	LCS	DUP/ORIG	MS/ORIG
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Solids	6130-153	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6130-153	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Solids	6130-153	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Solids	6130-153	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Solids	6130-153	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6130-153	15.0	1			1	1	1/1		
I	SOLID	Iodine 129 in Solids	6130-153	10.0	1			1	1	1/1		
Kinetic Phosphorimetry, ug												
U_T	SOLID	Uranium, Total in Solids	6130-153	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Solids	6130-153	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Solids	6130-153	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-PBS
Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

LAB WORK SUMMARY

SDG 7017

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Case no SDG H3602

LAB SAMPLE	CLIENT SAMPLE ID									
COLLECTED	LOCATION		MATRIX		SUF-					
RECEIVED	CUSTODY	SAF No		PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
R712003-01	B1N203			7017-001	AM		01/08/08	01/09/08	BW	Americium 241 in Solids
11/08/07	E-102 Push Soil		SOLID	7017-001	GAM		12/28/07	01/02/08	CSS	Gamma Scan
11/30/07	F07-001-047	F07-001		7017-001	H		12/13/07	12/18/08	BW	Tritium in Solids
				7017-001	I		01/10/08	01/16/08	BW	Iodine 129 in Solids
				7017-001	NI_L		01/09/08	01/14/08	BW	Nickel 63 in Solids
				7017-001	PU		01/08/08	01/09/08	BW	Plutonium, Isotopic in Solids
				7017-001	SR		01/07/08	01/11/08	BW	Total Strontium in Solids
				7017-001	TC		12/23/07	12/26/08	BW	Technetium 99 in Solids
				7017-001	U		12/29/07	12/31/07	BW	Uranium, Isotopic in Solids
				7017-001	U_T		02/15/08	02/18/08	MWT	Uranium, Total in Solids
R712003-02	Lab Control Sample			7017-002	AM		01/08/08	01/09/08	BW	Americium 241 in Solids
			SOLID	7017-002	GAM		12/28/07	01/02/08	CSS	Gamma Scan
		F07-001		7017-002	H		12/13/07	12/18/08	BW	Tritium in Solids
				7017-002	I		01/15/08	01/16/08	BW	Iodine 129 in Solids
				7017-002	NI_L		01/09/08	01/14/08	BW	Nickel 63 in Solids
				7017-002	PU		01/08/08	01/09/08	BW	Plutonium, Isotopic in Solids
				7017-002	SR		01/07/08	01/11/08	BW	Total Strontium in Solids
				7017-002	TC		12/26/07	12/26/08	BW	Technetium 99 in Solids
				7017-002	U		12/29/07	12/31/07	BW	Uranium, Isotopic in Solids
				7017-002	U_T		02/15/08	02/18/08	MWT	Uranium, Total in Solids
R712003-03	Method Blank			7017-003	AM		01/09/08	01/09/08	BW	Americium 241 in Solids
			SOLID	7017-003	GAM		12/28/07	01/02/08	CSS	Gamma Scan
		F07-001		7017-003	H		12/13/07	12/18/08	BW	Tritium in Solids
				7017-003	I		01/10/08	01/16/08	BW	Iodine 129 in Solids
				7017-003	NI_L		01/09/08	01/14/08	BW	Nickel 63 in Solids
				7017-003	PU		01/08/08	01/09/08	BW	Plutonium, Isotopic in Solids
				7017-003	SR		01/07/08	01/11/08	BW	Total Strontium in Solids
				7017-003	TC		12/22/07	12/26/08	BW	Technetium 99 in Solids
				7017-003	U		12/29/07	12/31/07	BW	Uranium, Isotopic in Solids
				7017-003	U_T		02/15/08	02/18/08	MWT	Uranium, Total in Solids

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol Fluor

Version Ver 1.0

Form DVD-LWS

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Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

WORK SUMMARY, cont.

SDG 7017
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H3602

LAB SAMPLE	CLIENT SAMPLE ID									
COLLECTED	LOCATION	MATRIX			SUF-					
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
R712003-04	Duplicate (R712003-01)		7017-004	AM		01/09/08	01/09/08	BW	Americium 241 in Solids	
11/08/07	E-102 Push Soil	SOLID	7017-004	GAM		12/29/07	01/02/08	CSS	Gamma Scan	
11/30/07		F07-001	7017-004	H		12/13/07	12/18/08	BW	Tritium in Solids	
			7017-004	I		01/11/08	01/16/08	BW	Iodine 129 in Solids	
			7017-004	NI_L		01/09/08	01/14/08	BW	Nickel 63 in Solids	
			7017-004	PU		01/08/08	01/09/08	BW	Plutonium, Isotopic in Solids	
			7017-004	SR		01/07/08	01/11/08	BW	Total Strontium in Solids	
			7017-004	TC		12/26/07	12/26/08	BW	Technetium 99 in Solids	
			7017-004	U		12/29/07	12/31/07	BW	Uranium, Isotopic in Solids	
			7017-004	U_T		02/15/08	02/18/08	MWT	Uranium, Total in Solids	

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	F07-001	Americium 241 in Solids	AMCMISO_IE_PLATE_AEA	1			1	1	1		4
GAM	F07-001	Gamma Scan	GAMMA_GS	1			1	1	1		4
H	F07-001	Tritium in Solids	TRITIUM_COX_LSC	1			1	1	1		4
I	F07-001	Iodine 129 in Solids	I129_SEP_LEPS_GS	1			1	1	1		4
NI_L	F07-001	Nickel 63 in Solids	NI63_LSC	1			1	1	1		4
PU	F07-001	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1		4
SR	F07-001	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	1			1	1	1		4
TC	F07-001	Technetium 99 in Solids	TC99_TR_SEP_GPC	1			1	1	1		4
U	F07-001	Uranium, Isotopic in Solids	UIISO_PLATE_AEA	1			1	1	1		4
U_T	F07-001	Uranium, Total in Solids	UTOT_KPA	1			1	1	1		4
TOTALS				10			10	10	10		40

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-LWS
Version 3.06
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3602

7017-003

Method Blank

METHOD BLANK

SDG <u>7017</u>	Client/Case no <u>Hanford</u>	SDG <u>H3602</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R712003-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7017-003</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F07-001</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.838	2.7	4.64	400	U	H
Nickel 63	13981-37-8	-0.813	1.8	3.10	30.0	U	NI_L
Total Strontium	SR-RAD	-0.052	0.18	0.235	1.00	U	SR
Americium 241	14596-10-2	0.027	0.11	0.259	1.00	U	AM
Technetium 99	14133-76-7	-0.088	0.53	1.72	15.0	U	TC
Total Uranium (ug/g)	7440-61-1	0	0.005	0.012	1.00	U	U_T
Uranium 233/234	U-233/234	0	0.048	0.182	1.00	U	U
Uranium 235	15117-96-1	0	0.058	0.221	1.00	U	U
Uranium 238	U-238	0.048	0.048	0.182	1.00	U	U
Plutonium 239/240	PU-239/240	0	0.030	0.113	1.00	U	PU
Iodine 129	15046-84-1	-0.405	0.55	1.26	2.00	U	I
Beryllium 7	13966-02-4	U		0.217		U	GAM
Potassium 40	13966-00-2	U		0.409		U	GAM
Cobalt 60	10198-40-0	U		0.037	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.254		U	GAM
Antimony 125	14234-35-6	U		0.080		U	GAM
Cesium 134	13967-70-9	U		0.049		U	GAM
Cesium 137	10045-97-3	U		0.030	0.100	U	GAM
Europium 152	14683-23-9	U		0.085	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.112</u>	0.100	U	GAM
Europium 155	14391-16-3	U		0.061	0.100	U	GAM

216A4 & 200E102 CharactSamp&Ana-Soil

QC-BLANK #64013

METHOD BLANKS

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/19/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

7017-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7017</u>	Client/Case no <u>Hanford</u>	SDG <u>H3602</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R712003-02</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7017-002</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F07-001</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	567	13	3.98	400	H	630	25	90	85-115	80-120
Nickel 63	255	6.3	3.10	30.0	NI_L	266	11	96	84-116	80-120
Total Strontium	10.1	0.41	0.213	1.00	SR	9.41	0.38	107	82-118	80-120
Americium 241	21.2	0.86	0.096	1.00	AM	20.2	0.81	105	88-112	80-120
Technetium 99	102	2.3	0.866	15.0	TC	109	4.4	94	84-116	80-120
Total Uranium (ug/g)	32.2	3.8	0.122	1.00	U_T	33.0	1.3	98	77-123	80-120
Uranium 233/234	19.9	2.1	0.910	1.00	U	18.6	0.74	107	80-120	80-120
Uranium 235	15.2	1.8	0.220	1.00	U	15.1	0.60	101	80-120	80-120
Uranium 238	18.8	2.0	0.873	1.00	U	20.2	0.81	93	83-117	80-120
Plutonium 238	23.2	1.8	0.232	1.00	PU	23.6	0.94	98	85-115	80-120
Plutonium 239/240	25.6	1.9	0.123	1.00	PU	26.4	1.1	97	86-114	80-120
Iodine 129	114	1.4	1.59	2.00	I	116	4.6	98	84-116	80-120
Cobalt 60	1.82	0.14	<u>0.087</u>	0.050	GAM	1.83	0.073	99	74-126	80-120
Cesium 137	1.92	0.14	<u>0.101</u>	0.100	GAM	1.89	0.076	102	74-126	80-120

216A4 & 200E102 CharactSamp&Ana-Soil

QC-LCS #64012

LAB CONTROL SAMPLES

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Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>02/19/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

7017-004

B1N203

DUPLICATE

SDG <u>7017</u>		Client/Case no <u>Hanford</u> <u>SDG H3602</u>	
Contact <u>Melissa C. Mannion</u>		Contract No. <u>630</u>	
DUPLICATE		ORIGINAL	
Lab sample id <u>R712003-04</u>	Lab sample id <u>R712003-01</u>	Client sample id <u>B1N203</u>	
Dept sample id <u>7017-004</u>	Dept sample id <u>7017-001</u>	Location/Matrix <u>E-102 Push Soil</u> <u>SOLID</u>	
	Received <u>11/30/07</u>	Collected/Weight <u>11/08/07 13:00</u> <u>786 g</u>	
% solids <u>96.5</u>	% solids <u>96.5</u>	Custody/SAF No <u>F07-001-047</u> <u>F07-001</u>	

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	DER σ
Tritium	3.35	2.4	3.91	400	U	H	3.30	2.4	3.91	U	-	0	
Nickel 63	-1.82	2.0	3.54	30.0	U	NI_L	-0.885	2.0	3.54	U	-	0.7	
Total Strontium	23.0	0.55	0.188	1.00		SR	21.2	0.90	0.500		8	22	1.1
Americium 241	0.598	0.27	0.245	1.00		AM	0.468	0.092	0.067		24	81	0.9
Technetium 99	26.1	2.2	1.15	15.0		TC	22.3	1.2	1.12		16	26	1.8
Total Uranium (ug/g)	1.14	0.13	0.012	1.00		U_T	1.18	0.14	0.012		3	31	0.3
Uranium 233/234	0.559	0.23	0.171	1.00		U	0.665	0.23	0.170		17	80	0.6
Uranium 235	0	0.054	0.207	1.00	U	U	0	0.054	0.205	U	-	0	
Uranium 238	0.514	0.23	0.171	1.00		U	0.421	0.18	0.170		20	94	0.6
Plutonium 238	0.015	0.12	0.214	1.00	U	PU	0.075	0.12	0.185	U	-	0.7	
Plutonium 239/240	2.16	0.38	0.114	1.00		PU	2.15	0.38	0.115		0	39	0
Iodine 129	0.538	0.75	1.68	2.00	U	I	-0.686	0.88	2.00	U	-	2.1	
Beryllium 7	U		0.573		U	GAM	U		0.671	U	-	0.2	
Potassium 40	14.7	1.1	0.388			GAM	14.4	2.2	0.521		2	41	0.2
Cobalt 60	U		0.058	0.050	U	GAM	U		0.053	U	-	0.1	
Ruthenium 106	U		0.341		U	GAM	U		0.461	U	-	0.4	
Antimony 125	U		0.112		U	GAM	U		0.120	U	-	0.1	
Cesium 134	U		0.059		U	GAM	U		0.067	U	-	0.2	
Cesium 137	0.167	0.048	0.049	0.100		GAM	0.140	0.056	0.059		18	79	0.7
Europium 152	U		0.144	0.100	U	GAM	U		0.144	U	-	0	
Europium 154	U		0.175	0.100	U	GAM	U		0.171	U	-	0	
Europium 155	U		0.159	0.100	U	GAM	U		0.154	U	-	0	

216A4 & 200E102 CharactSamp&Ana-Soil

QC-DUP#1 64014

DUPLICATES

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Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>02/19/08</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3602

7017-001

B1N203

DATA SHEET

SDG <u>7017</u>	Client/Case no <u>Hanford</u>	SDG <u>H3602</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R712003-01</u>	Client sample id <u>B1N203</u>	
Dept sample id <u>7017-001</u>	Location/Matrix <u>E-102 Push Soil</u>	<u>SOLID</u>
Received <u>11/30/07</u>	Collected/Weight <u>11/08/07 13:00</u>	<u>786 g</u>
% solids <u>96.5</u>	Custody/SAF No <u>F07-001-047</u>	<u>F07-001</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	3.30	2.4	3.91	400	U	H
Nickel 63	13981-37-8	-0.885	2.0	3.54	30.0	U	NI_L
Total Strontium	SR-RAD	21.2	0.90	0.500	1.00		SR
Americium 241	14596-10-2	0.468	0.092	0.067	1.00		AM
Technetium 99	14133-76-7	22.3	1.2	1.12	15.0		TC
Total Uranium (ug/g)	7440-61-1	1.18	0.14	0.012	1.00		U_T
Uranium 233/234	U-233/234	0.665	0.23	0.170	1.00		U
Uranium 235	15117-96-1	0	0.054	0.205	1.00	U	U
Uranium 238	U-238	0.421	0.18	0.170	1.00		U
Plutonium 238	13981-16-3	0.075	0.12	0.185	1.00	U	PU
Plutonium 239/240	PU-239/240	2.15	0.38	0.115	1.00		PU
Iodine 129	15046-84-1	-0.686	0.88	2.00	2.00	U	I
Beryllium 7	13966-02-4	U		0.671		U	GAM
Potassium 40	13966-00-2	14.4	2.2	0.521			GAM
Cobalt 60	10198-40-0	U		0.053	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.461		U	GAM
Antimony 125	14234-35-6	U		0.120		U	GAM
Cesium 134	13967-70-9	U		0.067		U	GAM
Cesium 137	10045-97-3	0.140	0.056	0.059	0.100		GAM
Europium 152	14683-23-9	U		0.144	0.100	U	GAM
Europium 154	15585-10-1	U		0.171	0.100	U	GAM
Europium 155	14391-16-3	U		0.154	0.100	U	GAM

216A4 & 200E102 CharactSamp&Ana-Soil

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/19/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

Test AM Matrix SOLID
SDG 7017
Contact Melissa C. Mannion

LAB METHOD SUMMARY

AMERICIUM 241 IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H3602

RESULTS

LAB RAW SUF- Americium
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID 241

Preparation batch 6130-153

R712003-01	7017-001	B1N203	0.468
R712003-02	7017-002	Lab Control Sample	ok
R712003-03	7017-003	Method Blank	U
R712003-04	7017-004	Duplicate (R712003-01)	ok

Nominal values and limits from method RDLs (pCi/g) 1.00
216A4 & 200E102 CharactSamp&Ana-Soil

METHOD PERFORMANCE

LAB RAW SUF- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV keV HELD PREPARED YZED DETECTOR

Preparation batch 6130-153 2σ prep error 5.0 % Reference Lab Notebook #6130 pg. 153

R712003-01	B1N203	0.067	0.500	82	986	61	01/08/08	01/08	SS-040
R712003-02	Lab Control Sample	0.096	0.500	62	987		01/08/08	01/08	SS-042
R712003-03	Method Blank	0.259	0.500	73	157		01/08/08	01/09	SS-040
R712003-04	Duplicate (R712003-01)	0.245	0.500	78	157	62	01/08/08	01/09	SS-042

Nominal values and limits from method 1.00 0.500 20-105 100 100 180

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
SPP-061	Determination of Moisture Content in Solid Samples	rev 0
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5	
CP-963	Americium and Curium in Water and Dissolved	
	Samples by Extraction Chromatography, rev 6	
CP-008	Heavy Element Electroplating, rev 9	

AVERAGES ± 2 SD	MDA <u>0.167</u> ± <u>0.199</u>
FOR 4 SAMPLES	YIELD <u>74</u> ± <u>17</u>

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Test PU Matrix SOLID

SDG 7017

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Contract SDG H3602

RESULTS

LAB	RAW	SUF-	Plutonium	Plutonium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	238 239/240

Preparation batch 6130-153

R712003-01	7017-001	B1N203	U	2.15
R712003-02	7017-002	Lab Control Sample	ok	ok
R712003-03	7017-003	Method Blank	U	
R712003-04	7017-004	Duplicate (R712003-01)	- U	ok

Nominal values and limits from method	RDLs (pCi/g)	1.00	1.00
216A4 & 200E102 CharactSamp&Ana-Soil			

METHOD PERFORMANCE

LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR

Preparation batch 6130-153 2σ prep error 5.0 % Reference Lab Notebook #6130 pg. 153

R712003-01	B1N203	0.185	0.500	77	188	61	01/08/08	01/08	SS-055
R712003-02	Lab Control Sample	0.232	0.500	75	185	01/08/08	01/08	SS-035	
R712003-03	Method Blank	0.113	0.500	80	185	01/08/08	01/08	SS-036	
R712003-04	Duplicate (R712003-01)	0.214	0.500	89	185	61	01/08/08	01/08	SS-038

Nominal values and limits from method	1.00	0.500	20-105	100	100	180
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PROCEDURES	REFERENCE	PUISO_PLATE_AEA
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5	
CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 3	
CP-008	Heavy Element Electroplating, rev 9	

AVERAGES ± 2 SD	MDA <u>0.186</u> ± <u>0.105</u>
FOR 4 SAMPLES	YIELD <u>80</u> ± <u>12</u>

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

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Lab id	<u>EBRLNE</u>
Protocol	<u>Fluor</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-LMS</u>
Version	<u>3.06</u>
Report date	<u>02/19/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7017
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H3602

RESULTS

LAB	RAW	SUF-		1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	233/234	235	238	1+3	2σ	2+3	2σ
Preparation batch 6130-153										
R712003-01		7017-001	B1N203	0.665	U	0.421	158	87	0	13
R712003-02		7017-002	Lab Control Sample	ok	ok	ok				
R712003-03		7017-003	Method Blank	U	U	U				
R712003-04		7017-004	Duplicate (R712003-01)	ok	- U	ok	109	66	0	11
Nominal values and limits from method										
			RDLs (pCi/g)	1.00	1.00	1.00	100		4	
216A4 & 200E102 CharactSamp&Ana-Soil							Averages 133		0	

METHOD PERFORMANCE

LAB	RAW	SUF-		MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
SAMPLE ID	TEST FIX	CLIENT	SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6130-153		2σ prep error 5.0 %		Reference Lab Notebook #6130		pg.		153								
R712003-01		B1N203		0.205	0.500			90		113			51	12/29/07	12/29	SS-055
R712003-02		Lab Control Sample		0.910	0.500			87		113				12/29/07	12/29	SS-056
R712003-03		Method Blank		0.221	0.500			83		113				12/29/07	12/29	SS-057
R712003-04		Duplicate (R712003-01)		0.207	0.500			86		114			51	12/29/07	12/29	SS-058
Nominal values and limits from method				1.00	0.500			20-105		100	100		180			

PROCEDURES REFERENCE UIISO_PLATE_AEA
SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5
CP-921 Uranium in Water and Dissolved Samples by
Extraction Chromatography, rev 1
CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 0.386 ± 0.699
FOR 4 SAMPLES YIELD 86 ± 6

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

Test SR Matrix SOLID
SDG 7017
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H3602

RESULTS

LAB	RAW	SUF-	Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID

Preparation batch 6130-153

R712003-01	7017-001	B1N203	21.2
R712003-02	7017-002	Lab Control Sample	ok
R712003-03	7017-003	Method Blank	U
R712003-04	7017-004	Duplicate (R712003-01)	ok

Nominal values and limits from method RDLs (pCi/g) 1.00
216A4 & 200E102 CharactSamp&Ana-Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED

Preparation batch 6130-153			2σ prep error	10.0 %	Reference Lab Notebook #6130	pg. 153							
R712003-01		B1N203	0.500	1.00			33	400			60	01/07/08	01/07 GRB-217
R712003-02		Lab Control Sample	0.213	1.00			76	400				01/07/08	01/07 GRB-218
R712003-03		Method Blank	0.235	1.00			76	400				01/07/08	01/07 GRB-219
R712003-04		Duplicate (R712003-01)	0.188	1.00			90	400			60	01/07/08	01/07 GRB-220

Nominal values and limits from method 1.00 1.00 30-105 100 180

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5	
CP-383	Strontium in Dissolved Solid of < 5.0g Aliquot, rev 1	

AVERAGES ± 2 SD	MDA <u>0.284</u> ± <u>0.291</u>
FOR 4 SAMPLES	YIELD <u>69</u> ± <u>49</u>

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LMS</u>
Version <u>3.06</u>
Report date <u>02/19/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOLIDS

BETA COUNTING

Test TC Matrix SOLID
SDG 7017
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H3602

RESULTS

LAB RAW SUF- Technetium
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID 99

Preparation batch 6130-153

R712003-01	7017-001	B1N203	22.3
R712003-02	7017-002	Lab Control Sample	ok
R712003-03	7017-003	Method Blank	U
R712003-04	7017-004	Duplicate (R712003-01)	ok

Nominal values and limits from method RDLs (pCi/g) 15.0
216A4 & 200E102 CharactSamp&Ana-Soil

METHOD PERFORMANCE

LAB RAW SUF- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 6130-153 2σ prep error 10.0 % Reference Lab Notebook #6130 pg. 153

R712003-01	B1N203	1.12	1.00	31	100	45	12/18/07	12/23	GRB-224
R712003-02	Lab Control Sample	0.866	1.00	44	89		12/18/07	12/26	GRB-221
R712003-03	Method Blank	1.72	1.00	31	50		12/18/07	12/22	GRB-227
R712003-04	Duplicate (R712003-01)	1.15	1.00	33	89	48	12/18/07	12/26	GRB-223

Nominal values and limits from method 15.0 1.00 20-105 50 180

PROCEDURES REFERENCE TC99_TR_SEP_GPC
SPP-062 Sample Aliquoting, rev 0
CP-431 Technetium-99 Purification of Soil or Resin by
Extraction Chromatography, rev 2
CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 1.21 ± 0.721
FOR 4 SAMPLES YIELD 35 ± 12

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

Test GAM Matrix SOLID
SDG 7017
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H3602

RESULTS

LAB RAW SUP-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Cobalt 60 Cesium 137

Preparation batch 6130-153

R712003-01	7017-001	B1N203	U	0.140
R712003-02	7017-002	Lab Control Sample	ok	ok
R712003-03	7017-003	Method Blank	U	U
R712003-04	7017-004	Duplicate (R712003-01)	- U	ok

Nominal values and limits from method RDLs (pCi/g) 0.050 0.100
216A4 & 200E102 CharactSamp&Ana-Soil

METHOD PERFORMANCE

LAB RAW SUP- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 6130-153 2σ prep error 15.0 % Reference Lab Notebook #6130 pg. 153

R712003-01	B1N203	<u>12.6</u>	251	207	50	12/18/07	12/28	JR,08,00
R712003-02	Lab Control Sample	<u>0.087</u>	250	136		12/18/07	12/28	JR,06,00
R712003-03	Method Blank	<u>9.89</u>	250	136		12/18/07	12/28	JR,07,00
R712003-04	Duplicate (R712003-01)	<u>11.7</u>	251	115	51	12/18/07	12/29	JR,02,00

Nominal values and limits from method 0.050 250 100 180

PROCEDURES REFERENCE GAMMA_GS
SPP-100 Ge(Li) Preparation for Commercial Samples, rev 7

AVERAGES ± 2 SD MDA 8.57 ± 11.5
FOR 4 SAMPLES YIELD _____ ± _____

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

Test I Matrix SOLID
SDG 7017
Contact Melissa C. Mannion

LAB METHOD SUMMARY

IODINE 129 IN SOLIDS
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H3602

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Iodine 129	
Preparation batch 6130-153					
R712003-01		7017-001	B1N203	U	
R712003-02		7017-002	Lab Control Sample	ok	
R712003-03		7017-003	Method Blank	U	
R712003-04		7017-004	Duplicate (R712003-01)	-	U
Nominal values and limits from method					
216A4 & 200E102 CharactSamp&Ana-Soil			RDLs (pCi/g)	2.00	

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR
Preparation batch 6130-153 2σ prep error 10.0 % Reference Lab Notebook #6130 pg. 153													
R712003-01		B1N203	2.00	1.00			48	587			63	01/10/08	01/10 XSPEC-004
R712003-02		Lab Control Sample	1.59	1.00			70	786				01/10/08	01/15 XSPEC-004
R712003-03		Method Blank	1.26	1.00			67	719				01/10/08	01/10 XSPEC-004
R712003-04		Duplicate (R712003-01)	1.68	1.00			38	992			64	01/10/08	01/11 XSPEC-004
Nominal values and limits from method			2.00	1.00			20-105	300			180		

PROCEDURES REFERENCE I129_SEP_LEPS_GS
SPP-062 Sample Aliquoting, rev 0
SPP-060 Soil Preparation, rev 0
CP-024 Iodine-129, Sample Dissolution, rev 5
CP-530 Iodine-129 Purification, rev 1

AVERAGES ± 2 SD MDA 1.63 ± 0.609
FOR 4 SAMPLES YIELD 56 ± 31

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

LAB METHOD SUMMARY

URANIUM, TOTAL IN SOLIDS

KINETIC PHOSPHORIMETRY, UG

Test U T Matrix SOLID

SDG 7017

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Contract SDG H3602

RESULTS

LAB	RAW	SUF-	Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID
			Uranium

Preparation batch 6130-153

R712003-01	7017-001	BiN203	1.18
R712003-02	7017-002	Lab Control Sample	ok
R712003-03	7017-003	Method Blank	U
R712003-04	7017-004	Duplicate (R712003-01)	ok

Nominal values and limits from method	RDLs (ug/g)	1.00
216A4 & 200E102 CharactSample	216A4 & 200E102 CharactSample	216A4 & 200E102 CharactSample

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	ug/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED

Preparation batch 6130-153 2σ prep error 9.0 % Reference Lab Notebook #6130 pg. 153

R712003-01	BiN203	0.012	0.0500	99	02/15/08	02/15	KPA-001
R712003-02	Lab Control Sample	0.122	0.0500		02/15/08	02/15	KPA-001
R712003-03	Method Blank	0.012	0.0500		02/15/08	02/15	KPA-001
R712003-04	Duplicate (R712003-01)	0.012	0.0500	99	02/15/08	02/15	KPA-001

Nominal values and limits from method	1.00	0.0500	180
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PROCEDURES	REFERENCE	UTOT_KPA
CP-929	Calibration of the Kinetic Phosphorimeter, rev 9	
SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 7	
CP-928	Total Uranium by Kinetic Phosphorimetry, rev 8	

AVERAGES ± 2 SD	MDA	0.040 ± 0.110
FOR 4 SAMPLES	YIELD	_____ ± _____

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol Fluor

Version Ver 1.0

Form DVD-LMS

Version 3.06

Report date 02/19/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3602

Test H Matrix SOLID

SDG 7017

Contact Melissa C. Mannion

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford

Contract No. 630

Contract SDG H3602

RESULTS

LAB RAW SUF-

SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Tritium

Preparation batch 6130-153

R712003-01		7017-001	B1N203	U
R712003-02		7017-002	Lab Control Sample	ok
R712003-03		7017-003	Method Blank	U
R712003-04		7017-004	Duplicate (R712003-01)	- U

Nominal values and limits from method RDLs (pCi/g) 400

216A4 & 200E102 CharactSamp&Ana-Soil

METHOD PERFORMANCE

LAB RAW SUF-

SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
-----------	----------	------------------	--------------	-----------	-------------	---------------	------------	----------	--------------	-------------	--------------	--------------	-------------------	------	----------

Preparation batch 6130-153			2σ prep error 10.0 %			Reference Lab Notebook #6130			pg. 153						
R712003-01		B1N203	3.91	0.475			100	50			35	12/13/07	12/13	LSC-005	
R712003-02		Lab Control Sample	3.98	0.400			100	50				12/13/07	12/13	LSC-005	
R712003-03		Method Blank	4.64	0.400			100	50				12/13/07	12/13	LSC-005	
R712003-04		Duplicate (R712003-01)	3.91	0.476			100	50			35	12/13/07	12/13	LSC-005	

Nominal values and limits from method 400 0.400 25 180

PROCEDURES REFERENCE TRITIUM_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 8

AVERAGES ± 2 SD MDA 4.11 ± 0.710
FOR 4 SAMPLES YIELD 100 ± 0

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Protocol Fluor

Version Ver 1.0

Form DVD-LMS

Version 3.06

Report date 02/19/08

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SAMPLE DELIVERY GROUP H3602

Test NI L Matrix SOLID
SDG 7017
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS
LIQUID SCINTILLATION COUNTING

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RESULTS

LAB RAW SUP-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63

Preparation batch 6130-153
R712003-01 7017-001 B1N203 U
R712003-02 7017-002 Lab Control Sample ok
R712003-03 7017-003 Method Blank U
R712003-04 7017-004 Duplicate (R712003-01) - U

Nominal values and limits from method RDLs (pCi/g) 30.0
216A4 & 200E102 CharactSamp&Ana-Soil

METHOD PERFORMANCE

LAB	RAW	SUP-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED
													YZED
													DETECTOR
Preparation batch 6130-153 2σ prep error 10.0 % Reference Lab Notebook #6130 pg. 153													
R712003-01		B1N203	3.54	0.500			84		50		62	01/09/08	01/09 LSC-004
R712003-02		Lab Control Sample	3.10	0.500			96		50			01/09/08	01/09 LSC-004
R712003-03		Method Blank	3.10	0.500			95		50			01/09/08	01/09 LSC-004
R712003-04		Duplicate (R712003-01)	3.54	0.500			84		50		62	01/09/08	01/09 LSC-004
Nominal values and limits from method			30.0	0.500			30-105		25		180		

PROCEDURES REFERENCE NI63_LSC
CP-071 Soil Dissolution, > 1.0g Aliquot, rev 5
CP-280 Nickel-63 Purification, rev 3

AVERAGES ± 2 SD MDA 3.32 ± 0.508
FOR 4 SAMPLES YIELD 90 ± 13

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SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
 - B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
 - H Similar to 'L' except the recovery was high.
 - P The RESULT is 'preliminary'.
 - X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
 - 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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Radiological tie to B1L1L2

SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS
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7992 2991 2166

**45 Days /
45 Days**

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None 11219

DATE/TIME

DATE/TIME

A-6003-618(01/06)



RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: F. HANFORD City: RICHMOND State: WA
Date/Time received: 11/30/07 09:30 CoC No: F07-001-047
Container I.D. No: ERC-99-057 Requested TAT (Days): 45 P.C. Received Yes [] No []

INSPECTION

- 1 Custody seals on shipping container intact? Yes [X] No [] N/A []
2 Custody seals on shipping container dated & signed? Yes [X] No [] N/A []
3 Custody seals on sample containers intact? Yes [X] No [] N/A []
4 Custody seals on sample containers dated & signed? Yes [X] No [] N/A []
5 Packing material is Wet [] Dry [X]
6 Number of samples in shipping container: 1 Sample Matrix: S
7 Number of containers per sample: 2 (Or see CoC _____)
8 Samples are in correct container Yes [X] No []
9 Paperwork agrees with samples? Yes [X] No []
10 Samples have Tape [] Hazard labels [] Rad labels [] Appropriate sample labels [X]
11 Samples are in good condition [X] Leaking [] Broken Container [] Missing []
12 Samples are Preserved [] Not preserved [] pH _____ Preservative _____
13 Describe any anomalies.

14 Was F M notified of any anomalies? Yes [] No [] Date _____
15 Inspected by: M. Hanford Date: 12/03/07 Time: 09:00

Customer Sample No	Beta/Gamma com	Ion Chamber mR/hr	Wide	Customer Sample No	Beta/Gamma com	Ion Chamber mR/hr	Wide
BIN203	<60						

Ion Chamber Ser. No. _____
Alpha Meter Ser. No. _____
Beta/Gamma Meter Ser. No. 100482

Calibration date _____
Calibration date _____
Calibration date 07/14/07